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Original Article

Effectiveness of teaching COVID-19 protective and preventive behaviors on perceived and behavioral responses of students

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Abstract

Background & Aims: This research was conducted with the aim of investigating the effectiveness of teaching protective and preventive behaviors against COVID-19 on perceived and behavioral responses of students of Islamic Azad University, Sari Branch, Iran.

***Materials & Methods*:** The current research method was a semi-experimental pre-test and post-test type with experimental and control groups. The statistical research population included all the students of Islamic Azad University, Sari Branch, Iran. 24 people were selected among them using the voluntary sampling method and were then randomly assigned into experimental and control groups. The research tool was a scale based on the protection motivation theory of Leidy and Ermord (2001). The protective and preventive behaviors of training was measured in 8 sessions of 90 minutes for the experimental group. The data were analyzed by SPSS statistical software version 26 and using one-way analysis of variance and covariance analysis to check the equality of means at the significance level of below 0.05.

***Results*:** The results of the covariance showed that training COVID-19 protective and preventive behaviors was significantly effective on the perceived and behavioral responses of the students of Islamic Azad University, Sari Branch ($P < 0.001$).

Conclusion: Teaching protective and preventive behaviors against Covid-19 is effective in motivating protection, especially for the variables of perceived responses and meaningful behavioral responses. Considering the effectiveness of this method, its results can be used in future researches.

***Keywords*:** Behavior Training, Behavioral Responses, COVID-19, Perceived Responses

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Introduction

In December 2019, the spread of a viral disease was reported in the Chinese city of Wuhan. The cause of this disease was a new type of genetically modified virus from the family of corona viruses called COVID-19, which was named the disease as Covid-19 (1). Unfortunately, due to its high contagiousness, this virus quickly spread throughout the world and in a short period of time (less than four months), it infected all the countries of the world (2). This infectious disease not only threatens the physical health of the society and in some cases their death, but also often creates uncertainty

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and confusion in people (3). It has caused unbearable psychological pressure for the involved communities such as stress, anxiety, depression, unresolved grief, and post-traumatic stress disorder (4).

The results of Alizadeh and Safarinia's research (5) showed that the anxiety of corona disease (negatively) and social solidarity caused by corona disease (positively) are correlated with mental health. It was also found that anxiety and social connection caused by corona disease predict mental health. Dehkordi et al. in a study titled "Psychosocial Consequences of the New Corona Virus Disease (Covid-19)" concluded that the most common psychological consequences of the new Corona Virus include fear of death, depression, and anxiety (6). Also, the reduction of social activities, the feeling of being rejected by the society, the reduction of effective communication with the family and surrounding people, and the experience of stigma by the patient and his family are among the social consequences of this disease.

In the study of Moradi and Mohammadifar it was found that social networks have a significant effect on the formation of social phobia, but it has a non-significant relationship with lifestyle changes (7). Also, internal social networks have significant and opposite effects on the formation of social phobia and lifestyle changes. The results show that Viber, Instagram, and Facebook social networks were able to explain the changes related to lifestyle changes and Soroush messenger was able to explain the changes related to lifestyle changes (7).

One of the variables related to the Corona virus is perceived and behavioral responses, which are the main variables in the protection motivation theory. The protection motivation theory is one of the most efficient theories in predicting protective and preventive behaviors, which is first based on motivation and then emphasizes on the development of adaptation skills of people (8). This theory includes three stages of threat assessment, coping assessment, and fear structure. Threat assessment emphasizes factors that increase or decrease the likelihood of maladaptive responses such as avoiding protective behavior or denying a health threat. This cognitive mediation stage consists of the constructs of perceived sensitivity, perceived severity, and perceived rewards. Coping assessment emphasizes responses on coping with health threats and factors that increase and decrease the likelihood of adaptive responses (performing the recommended health behaviors) (9). In other words, it assesses the ability to cope with or avoid from health threats. This cognitive mediation stage consists of the constructs of perceived self-efficacy, perceived response efficacy, and perceived response costs. Fear is an intermediate variable between perceived sensitivity, perceived severity, and threat evaluation, and protection motivation is synonymous with behavioral intention that causes the protection behavior to be triggered or continued, and as a mediating construct between two stages (threat evaluation and coping) and protective behavior works. In order for motivation to be felt protected, perceived sensitivity and severity must overcome maladaptive (non-self-protective) responses, and perceived self-efficacy and perceived response efficacy must overcome maladaptive (self-protected) responses (10).

Considering the psychological and health effects of the Corona disease and the mortality caused by it, in addition to the impact that the disease has on the patient's lifestyle, many of these factors and its subsequent complications are still unknown. It can be said that one of the major effects of Corona in the lives of all people is the change in the style of observing health issues. The greatest success in health behavior promotion programs is achieved when, in addition to knowing the current situation, attention is paid to the factors that somehow affect human behavior. One of the educational models is the health motivation model

developed by Rogers in 1975. In this model, it is assumed that accepting health behavior (protective behavior) recommended against health risk is a direct action of the individual's motivation to protect oneself (11).

Rogers (12) proposed that fear affects protection motivation (or the intention to perform protective behavior against health risk) through five constructs, and protection motivation ultimately motivates health behavior. These five constructs are: 1- Perceived self-efficacy: the individual's belief that he can successfully perform the protective behavior, 2-Perceived response efficacy: A person's expectation that an adaptive response (protective behavior against a health risk) can eliminate the risk, 3- Perceived vulnerability: A person's belief that they are vulnerable to a health hazard, 4- Perceived severity: a person's belief that the risk is serious, and 5- Perceived response costs: A person's estimate of any costs (such as money, people, time, and effort) associated with engaging in protective behavior. The findings of this theory in various studies have shown that the constructs of this theory are very important in predicting preventive behaviors.

Humans may face many crises during their life, in which the management of mental states and stress is of great importance. Due to the sensitive and momentary conditions during the time of the Corona virus, people should abandon indoctrination when hearing news or information about any phenomenon or disease and use different methods to keep themselves away from negative events and thoughts in order to calm them down. In some cases suggestibility occurs through family members themselves or through virtual space and certain groups, and people who suffer from suggestibility and obsession should be careful, because the possibility that suggestibility turns into obsession is very high, and the same problem leads to a decrease in the quality of life (13). Therefore, this research was conducted with the aim of investigating the training of protective and preventive behaviors against COVID-19 on perceived responses and behavioral responses in the students of Islamic Azad University, Sari Branch, Iran.

Materials and Methods

The current research method was a semi-experimental type of pre-test and post-test with experimental and control groups. The statistical research population included all the students of Islamic Azad University, Sari Branch, Iran in the academic year of 1400-1401 Solar Hijri. 24 people were selected among them using the voluntary sampling method and were randomly assigned to an experimental group and a control group. The criterion for the research was: 1) obtaining a standard deviation score lower than the mean from the protection perception questionnaire, and getting infected with the Corona virus during the Corona epidemic. The criteria for withdrawing from the study were the absence of more than 2 sessions in the training of protective and preventive behaviors from COVID-19 and contracting the Corona virus during the intervention.

Considering that groups of 9 to 12 people are usually used in semi-experimental researches, in this study, an intervention group of 12 people was selected and they responded to the research tool in two stages. The research tool included a scale based on the protection motivation theory of Leidy and Ermord (2001). The protective and preventive behavior training intervention was carried out in 8 sessions of 90 minutes for the experimental group.

The tools used in this study were: (1) Protection Motivation Theory-Based Scale and (2) Teaching protective and preventive behaviors from Covid-19. Protection Motivation Theory-Based Scale includes questions related to the protection motivation theory constructs created by Khodayarian et al. in 2019 (14)

and has 9 subscales of Perceived intensity (3 questions) , perceived vulnerability (7 questions), fear (9 questions), perceived response efficacy (8 questions), self-efficacy (8 questions), perceived cost (7 questions), perceived rewards (5 questions) were composed on a 5-point Likert scale with options from strongly disagree to strongly agree. Each question was assigned a score between 1 and 5. The minimum and maximum score for perceived severity are ranged from 3 to 15, perceived vulnerability from 7 to 35, fear from 3 and 15, perceived response efficacy from 4 to 20, self-efficacy from 8 to 40, perceived cost from 4 to 20, the perceived rewards from 2 to 10, and the motivation to protect from 1 and 5. The behavior intention was investigated with 1 question. The content validity of the scale was confirmed by the opinion of expert professors, and its reliability was confirmed by calculating the Cronbach's alpha coefficient of 0.80. Based on the research Khodayarian et al. in 2019, in the evaluation of qualitative and quantitative formal validity, all constructs of the protection motivation theory had an impact score higher than 1.5, and the reliability of the scale was acceptable (14).

Teaching protective and preventive behaviors from Covid-19 is one of the most effective theories in predicting preventive behaviors, which first emphasizes motivation and then the development of adaptive skills. In this research, the factors affecting motivation, intention, and behavior in people's posts in cyber space were identified. The main content of the messages associated with each protection motivation component is shown in table 1.

Table 1: suggested training program to enhance conservation motivation

Meetings	Objectives of the meetings	The topic of the meetings
First	Investigating the perceived sensitivity to the crisis	Training to properly assess the effects of the crisis
Second	Examining the perceived threat of the crisis	Understanding the exact effects of the crisis on the individual
Third	Improving people's attitudes towards self-care and examining perceived rewards	Encouraging people to take care of themselves and prevention
Fourth	Awareness of the effects of self-care in reducing crisis costs	Expressing the importance of preventive behaviors to reduce the costs of illness
the Fifth	Identifying fear and teaching positive coping strategies	Stress coping skills training
the Sixth	Awareness of the effects of self-care and perceived self-efficacy	Impulse control training and self-efficacy enhancement
the Seventh	Identifying behaviors that lead to perceived response effectiveness.	The importance of preventive behaviors for better life and performance in this era
Eighth	Cultivating protection motivation	Practicing self-care behaviors and internalizing self-care motivation in the Corona era

The data were analyzed with SPSS version 26 statistical software, using one-way analysis of variance and covariance analysis to check the equality of means at a significance level of below 0.05.

Results

The demographic variables of the participants by gender showed that in the experimental group of

protective and preventive behavior training, 83.3% (10 people) were female and 16.7% (2 people) were male, and in the control group, 53.3 (7 people) of the participants were women and 41.3% (5 people) were men. The marital status of the experimental group showed that 33.3% (4 people) were single and 66.7% (8 people) were married, and in the control group 25% (3 people) were single and 75% (9 people) were married.

Demographic variables of the participants according to the level of education in the experimental group were respectively: diploma 41.7% (5 people), master's degree 33.3% (4 people), and bachelor's degree 25% (3 people). In the control group diploma was 41.7% (5 people), bachelor's degree was 25% (3 people), and master's degree was 33.3% (4 people).

Frequency distribution, mean, and standard deviation of age showed that the mean and standard deviation of age of the experimental group was 40.50±14.69 and the mean and standard deviation of the age of the control group was 46±12.06.

Table 2: The test of equality of variances of the study groups in perceived responses and behavioral responses

Scales	f	df1	df2	Sig (p)
Perceived answers	0.166	1	16	0.687
Behavioral responses	0.170	1	16	0.898

Table 2 shows Levin's test for the equality of variances of the scores in the protection motivation subscales in the study groups. One of the assumptions of the covariance analysis test is to check the homogeneity of variances in the study groups, and therefore, Levine's test was used. Considering the lack of significance and the confirmation of the null hypothesis ($P < 0.05$), the assumption of equality of variances in the groups was confirmed.

Table 3: Post-test adjusted means of perceived responses and behavioral responses

95% confidence interval		Standard error	adjusted means	group	Scales
upper line	lower limit				
19.216	17.286	0.464	18.251	Experiment	Answers understood
17.380	15.450	0.464	16.415	Control	
22.557	20.563	0.479	21.560	Experiment	Behavioral responses
20.353	18.360	0.479	19.357	Control	

Table No. 3 shows the post-test adjusted averages in the scales of perceived responses and behavioral responses of the participants in the study groups. The adjusted averages were the result of controlling the pre-test scores in univariate analysis of covariance.

Table 4: The results of the covariance analysis of the difference in the mean scores of the perceived responses and the behavioral responses of the participants in the study groups

Effective Factors	Dependent Variables	df	Mean Square	F	sig	Effect size Eta.
pre-exam	Answers understood	1	23.650	9.280	0.006**	0.31
	Behavioral responses	1	9.835	3.618	0.071	0.15
Group membership	Answers understood	1	19.678	7.722	0.011*	0.27
	Behavioral responses	1	28.343	10.427	0.004**	0.33

(**) significance at 0.01 level and (*) significance at 0.05 level

Table No. 4 shows the results obtained from the covariance analysis test of the average difference between perceived responses and behavioral responses in the study groups. The results of group membership show that the averages in the experimental group are statistically significantly different from the control group ($P<0.05$). In other words, the post-test averages of perceived responses and behavioral responses of the participants in the experimental group who were trained in protective and preventive behaviors from Covid-19 have increased compared to the control group who were not trained.

Discussion

The aim of the present study was to investigate the effect of teaching protective and preventive behaviors against COVID-19 on perceived responses and behavioral responses in the students of Islamic Azad University, Sari Branch, and the results indicated that teaching protective and preventive behaviors against COVID-19 on perceived responses and behavioral responses in students was effective.

The fast spread of the Corona virus not only in Iran, but also in other countries, has practically become a major challenge, and it should be considered as a serious social threat in this period of transition. In particular, the spread of Corona has imposed a new individual, family and social lifestyle on today's world. However, the psychological and health consequences of the Covid-19 disease are different in medical and health care personnel, ordinary people, infected patients, the families of infected patients, and children (15).

The results of this study showed that the training of protective and preventive behaviors was effective on the motivation of students to protect themselves during the outbreak of Covid-19. Therefore, the evidence for this hypothesis is sufficient. The results of this study are in agreement with Tong's study (16) that self-efficacy and inconsistent response reward have a significant relationship with the intention to vaccinate Covid-19, as well as with Wang's study (17) that the perceived severity of Covid-19 has a positive relationship with vaccination motivation. It is also in parallel with Kowalski Black's study (18), stating that the strains one and two of the COVID-19 outbreak are positively correlated with perceived severity and self-efficacy, with Okuhara, Okada, Kiuchi's (19) study stating that during quarantine, perceived severity and self-efficacy are significantly higher levels of predict staying at home after social control, with Azadeh et al.'s research (20) stating that there is a significant relationship between coping evaluation and protection motivation, with Tavakli et al.'s study (21) stating that its protective behaviors with self-efficacy, benefits perceived and perceived intensity have a positive and significant correlation, and with perceived sensitivity and perceived barriers, there is a negative and significant correlation, it is almost consistent.

In explaining the findings of these two hypotheses, it can be said that COVID-19 has caused mental pressure on people in different situations and has threatened mental health, and still new strains of COVID-19 have overshadowed the quality of life of people in different societies (22). In addition, it has led to a decrease in the quality of academic life and an increase in occupational and academic procrastination and other psychological, academic and functional problems.

Based on the components of Rogers' protection motivation theory (12), excessive stress towards this virus and all the consequences mentioned above have produced a kind of ceaseless threat that must be fought and countered psychologically and behaviorally at the global level. In a way that is based on the anxieties, tensions and hidden, and obvious fears of humans, it is projected and reflected in virtual spaces. Prager et al. (2020) showed that people have a lot of negative feelings including: confusion and pessimism towards life, intellectual-practical obsessions about the body and washing all the things that come into the house, intellectual concerns about endangering the health of the family, and economic concerns (23).

Therefore, to fight and resist these conditions, the existence of a comprehensive educational program based on the theory of protected motivation seems necessary. This program can target and improve the perceived threat and harm people in critical situations. On the other hand, no matter how much people believe that they will be more and stronger by performing preventive and protective behaviors against Covid-19, it is more likely that they will respond to the threats and damages caused by it and if they are affected by the conditions injuries such as contracting Covid-19, we should first estimate the psychological and economic costs in critical situations and then take action. As a result, based on training based on protected motivation, it is likely that the intention to perform protective behaviors will increase and people will pay more attention to health and preventive messages than threatening messages and use them with more cognitive processing. Actually, teaching protective and preventive behaviors on the motivation of self-protection helps people to consider the situation as it is real and increase their self-efficacy in critical situations. Assess the perceived threat correctly and have correct behavioral responses. This process becomes automatic and produces a cognitive cycle to maintain people's health.

Conclusions

The findings showed that the self-protection motivation training package increased the total means of self-protection motivation in the post-test phase of the experimental group, but it had no effect on the control group. In fact, it can be said that no matter how much people's awareness and attitude towards the crisis are based on correct and accurate information and proper training is given to people to perform preventive behaviors, the intention to perform preventive behavior also becomes more and more precise in critical and complex situations. When people understand that they have the ability to take preventive measures in emergency and unpredictable situations, they express their mental and psychological readiness to participate in preventive behaviors, and they see themselves more empowered in facing situations and making more efforts. They get practical and useful training in the field of prevention and facing crises. Therefore, it is suggested that this educational study be provided to health therapists, doctors, psychologists and other clinical professionals in order to promote self-protection measures.

Limitations

The limitations of the research were: the use of a questionnaire in this field and not considering similar

variables due to the nature of the research during the Corona outbreak, Limitation of protocol design to virtual space messages in a certain period of time, and impossibility of implementing the follow-up phase due to the virtualization of the education flow in the university. Therefore, in order to reduce the limitations, it is suggested that in the future studies, intervention methods in the form of educational protocols other than protected motivation are used in different samples. Also in the future studies, the training program based on protected motivation should be used in the outbreak of different types of diseases or crises in order to better understand the effectiveness of this theory.

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